

FACE INVESTIGATION

SUBJECT: Farmer Asphyxiated After Entering Sealed Silo

SUMMARY:

A 33 year old male dairy farmer (the victim) died after entering a sealed silo through the access door. He had been removing high moisture shelled corn from the silo using an auger unloader when the grain apparently stopped flowing. The victim removed an access door cover and entered the silo. A three-year old family member had accompanied the victim to the feedroom and noted after an unknown length of time that the victim was not moving inside the silo. The family member summoned the farmer's wife for assistance. She saw him lying near the access opening, reached in, and pulled the victim from the silo. A farm visitor called for an ambulance. Police, EMS and the coroner arrived, and the victim was pronounced dead at the scene. The coroner examined the body at the funeral home and obtained blood samples. No autopsy was performed. The Wisconsin FACE investigator concluded that, in order to prevent similar occurrences, farmers should:

- ! Obtain comprehensive education and training on confined space entry procedures, and implement these procedures whenever they work with confined space conditions.**
- ! Ensure that silos and other confined spaces are posted with appropriate warning signs.**

INTRODUCTION:

On September 30, 1993, a 33 year old farmer died after entering a sealed silo. The Wisconsin FACE investigator was notified of the incident on October 5, 1993, by a state university agricultural engineering professor. On February 9, 1994, the Wisconsin FACE field investigator conducted an investigation of the incident. The victim's wife was interviewed, and photographs were taken of the incident site. Copies of the death certificate, sheriff's report and the county coroner's report were obtained.

The dairy farm where the incident occurred has been in operation for over thirty years. The silo has been on-site for about twenty years. The victim had been working at the site for two years and was making arrangements to purchase the farm. He had previously worked on other dairy farms, and received most of his training through on-the-job experience. There was no written farm safety policy or safety program, or formal training program for farm workers. The farm owner and the farmer's wife reported that the farmer knew that entering the silo could be unsafe.

INVESTIGATION:

On the day of the incident, the victim had been performing routine chores on the farm. He had been removing high moisture shelled corn from a sealed silo which was almost empty of corn. An auger unloader

located in the floor of the silo was unloading the grain outside the silo. The silo has an access door located above the auger outlet which is interlocked with the auger unloader to prevent operation of the unloader when the access door is opened. At the time of the incident, the door interlock system had been modified to render it inoperative. Safety decals recommended by the silo manufacturer to identify the danger of entering the silo were not posted on the day of the incident, and it is unknown if they had ever been in place.

Prior to the incident, the grain apparently stopped flowing from the auger and the victim removed the access door cover and entered the silo. A three-year old family member had accompanied the victim to the feedroom and noted after an unknown length of time that the victim was not moving inside the silo. The family member summoned the farmer's wife for assistance. She saw him lying near the access door opening, reached into the opening and pulled the victim from the silo. She did not use any rescue equipment or techniques (e.g. lifelines, respiratory protection, standby persons). A farm visitor arrived at the site soon after the victim was pulled from the silo, and called for an ambulance. Police, EMS and the coroner arrived, and the victim was pronounced dead at the scene. The coroner examined the body at the funeral home and obtained blood samples. No autopsy was performed.

CAUSE OF DEATH: The coroner listed the cause of death as asphyxia, overcome by silo gas. The results of the blood samples were unable to be evaluated, because the actual time of death was undetermined.

RECOMMENDATIONS/DISCUSSION:

Recommendation # 1: Farmers should obtain comprehensive education and training on confined space entry procedures and implement these procedures whenever they work with confined space conditions.

Discussion: Farmers should be trained to implement a confined space entry program that addresses the following:

- ! evaluation to determine whether entry is necessary
- ! correct use of safeguards, such as interlocks
- ! use of proper ventilation equipment and procedures
- ! use of lifelines and retrieval systems
- ! stationing a standby attendant outside the space for communication and visual monitoring
- ! instruction of farm workers and family members in safe confined space rescue procedures

In this incident, a thorough evaluation might have indicated methods of dealing with the problem of interrupted grain flow that did not require entry into the silo. The operator's manual described troubleshooting procedures that did not require entry, and specified ventilation procedures if entry was required for any reason. The additional steps would have prevented the fatality.

Recommendation # 2: Ensure that silos and other recognized confined spaces are posted with appropriate warning signs.

Discussion: Silos and other confined spaces should be posted with warning signs to alert workers to the hazards associated with entering a confined space. The silo manufacturer normally supplies and installs these signs, and it is unknown why they were not in place at the time of the incident. The operator's manual that is distributed by the silo manufacturer describes the locations of warning signs, and indicates that it is the owner/operator's responsibility to request and install replacements for worn, damaged or missing decals. Although the warning signs were not in place at the time of the incident, at the time of the investigation there were warning signs near the access door and on the silo exterior near the entry to the feedroom.